



SAFETY DATA SHEET

SECONDARY NICKEL-CADMIUM SEALED CELLS

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1. IDENTIFICATION

1.1 Product

Sealed secondary (or rechargeable) Cells

Trade name and model: SAFT, V... according model.

IEC designation: KR... according international standard IEC 61951-1

Electrochemical system: Nickel/Cadmium, alkaline electrolyte

Positive electrode: Nickel hydroxide

Negative electrode: Cadmium hydroxide

Electrolyte: Potassium, Sodium and Lithium hydroxide in water solution.

Nominal voltage: 1.2Volts

1.2 Supplier

Name: SAFT

Address: 12 rue Sadi Carnot – 93170 BAGNOLET

Tel/Fax: +33 (0)1 49 93 19 18 / +33 (0)1 49 93 19 50

Emergency contact: SAFT local dealer.

2. **COMPOSITION** (Weight percentage of basic materials)

Single cell with steel container

| Metals | | % | Plastics | | % | Other | | % |
|---------|----|-----------|--------------|-------|-----------|-----------|------------------|-----------|
| Iron | Fe | 25 - 37 | Polyamide | PA/PP | 2.5 - 3.5 | Potassium | K/Na/Li | 1.8 - 2.9 |
| Nickel | Ni | 20 - 28 | Rubber | EPDM | < 0.05 | Water | H ₂ O | 4 - 9 |
| Cadmium | Cd | 10 - 15 | Polyethylene | PE | 0.2 - 0.4 | OH- | | 8 - 14 |
| Cobalt | Co | 0.4 - 1.0 | PVC | | 0.2 - 0.7 | | | |

3. **HAZARDS**

A- Human hazards

A sealed Nickel-Cadmium cell is not hazardous in normal use.

3.1 Physical

Nickel plated steel can do not present any risk if cells are used for its intended purpose and according to valid directions for use.

3.2 Chemical

Nickel plated steel can do not present chemical risk in normal use.

In case of misuse (abusive over charge, reverse charge, external short circuit...) and in case of default, some electrolyte can leak from the cell through the safety vent. In these cases refer to the risk of the Alcaline hydroxides.

The toxic properties of the electrode materials are hazardous only if the materials are released by mechanical damaging the cell or if exposed to fire.

Classification of dangerous substances contained into the cells.

| SUBSTANCES | | | CLASSIFICATION | | | |
|------------------------|----------------------------|---------------------|----------------|-----------------------------|---------------------|-------------------------|
| Name | EEC Number CAS Number | Symbol | Letter | Identification of danger | Special risk (1) | Safety advice (2) |
| Cadmium Hydroxide | 048-001-00-5 21041-95-2 | Cd(OH) ₂ | Xn | Harmful | R 20/21/22 | S 22 |
| Nickel Hydroxide | 028-008-x* 12054-48-7 | Ni(OH) ₂ | Xn | Harmful | R 20/22-43-40 | S 22/36 |
| Cobalt Hydroxide | - 21041-93-0 | Co(OH) ₂ | Xn | Harmful | R22-42/43 | S22-24-37 |
| Alcalines hydroxide | 019-002-00-8 1310-58-3 | KOH NaOH LiOH | C | Corrosive | R 35 | S 26-37/39 -45 |

(1) Nature of special risk

- R 20/21/22 : Harmful by inhalation, skin contact or if swallowed.
R 20/22: Harmful by inhalation or if swallowed.
R 35: Causes serious burns .
R 40: Possible risk of irreversible effects.
R 43: May cause sensitising by skin contact.
R42/43: May cause sensitising by inhalation and skin contact.

(2) Safety advice

- S 22: Do not breathe dust.
S 24: Avoid contact with skin
S 26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 36: Wear suitable protection clothing.
S 37: Wear suitable gloves.
S 37/39: Wear suitable gloves and eyes/face protection.
S 45: In case of accident or if you feel unwell, seek medical advice immediately.

B- Ecological hazards

Metals used in a Ni-Cd cell, and specifically the cadmium, have to be collected and recycled.

4. FIRST AID MEASURES

In case of electrolyte solution spill (cell leakage) precautions must be taken to avoid any contact of human tissues. If it accidentally happens following must be done:

4.1 Inhalation

Fresh air. Rinse mouth and nose with water. Medical treatment.

4.2 Skin contact

Rinse immediately with plenty of water. Medical treatment.

4.3 Eyes contact

Rinse immediately with plenty of water during at least 15-30 min .Immediate hospital treatment. Consult eye specialist.

4.4 Ingestion

If the injured is fully conscious: plenty of drink, preferably milk. Do not induce vomiting. Immediate Hospital treatment.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable: Class D-Dry chemical, sand, CO₂.

Not to be used : Water.

5.2 Special exposure hazards

Cells can be overheated by an external source or by internal shorting and release alkaline electrolyte mist or liquid. In fire situations fumes containing Cadmium may evolve. Electrolyte reacts with zinc, aluminum, tin and other active materials releasing flammable hydrogen gas.

In case of PVC sleeved products, the combustion releases chloride gas.

5.3 Special protective equipment

Use self-contained breathing apparatus and full fire-fighting protective clothing.

6. SPILL MANAGEMENT PROCEDURE

The sealed Ni-Cd cells when sleeved are safe in case of spilling.

Non-sleeved cells may generate short-circuits, causing release of alkaline electrolyte mist or liquid. Electrolyte reacts with zinc, aluminium, tin and other active materials releasing flammable hydrogen gas. In such a case, use self-contained breathing apparatus and protective clothing.

7. HANDLING AND STORAGE

In normal use conditions, no safety rule is specified to handle the cells.

It is recommended to store following SAFT specifications in order to ensure longer usage: +5 to +25°C in a 65 +- 5% relative humidity.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Under normal condition of use and handling no special protection is required for sealed Ni-Cd cells.

9. PHYSICAL PROPERTIES

9.1 Appearance

Nickel plated steel cylindrical cell, eventually sleeved. Dimensions and colour according specification.

9.2 Temperature range

Risk of electrolyte leakage over 100°C

9.3 Specific energy

35 to 45 Wh/Kg

9.4 Specific instant power

Up to 1000 W/Kg during 1 second

9.5 Mechanical resistance

According mechanical tests in IEC 61951-1 standard.

10 STABILITY AND REACTIVITY

10.1 Conditions

Ni-Cd cells are stable in storage.

In case of storage in Humidity, some rust may appear on the product.

In case of storage in a charged state, cells progressively loose their energy, generating eventually a progressive temperature increase according the thermal insulation efficiency of the packaging.

In case of exposure to temperature over 100°C, a risk of release of alkaline electrolyte mist or liquid is created. A higher temperature (160°C) the plastics used can melt or decompose (Polyamide gasket, rubber valve, PVC sleeve,...).

In case of mechanical deterioration of the cells, active materials contained as powder can be dispersed (Nickel, Cobalt, cadmium).

10.2 Hazardous decomposition products

Electrolyte solution is corrosive to all human tissues and will react violently with many organic chemicals .

Electrolyte solution reacts with zinc, aluminium, tin and other materials releasing flammable hydrogen gas.

11 TOXICOLOGICAL INFORMATION

| SUBSTANCES | | | HAZARDS | | |
|---------------------|----------------------------|---------------------|------------------------------|--|-----------------|
| Name | N° EEC N° CAS | Symbole | effects | Dust exposure limits | Carcinogenicity |
| Cadmium Hydroxyde | 048-001-00-5 21041-95-2 | Cd(OH)2 | LD50. Not available | VME :50 µg/m3 VLE : 50 µg/m3 (for CdO) | Occupational |
| Nickel Hydroxyde | 028-008-x* 12054-48-7 | Ni(OH)2 | LD50/oral/rat: 1600 mg/Kg | VME : 1000 µg/m3 VLE : / | Occupational |
| Hydroxyde de cobalt | - 21041-93-0 | Co(OH)2 | LD50. Not available | VME : 100 µg/m3 VLE : / | / |
| alkaline Hydroxydes | 019-002-00-8 1310-58-3 | KOH NaOH LiOH | LD50/oral/rat: 365mg/Kg | KOH VME: 2mg/m3 NaOH VME:2mg/m3 LiOH VME : 25µg/m3 | / |

12 ECOLOGICAL INFORMATION

The storage battery is TCLP toxic. If not recycle, must be disposed of in accordance with all state and local regulations.

13 DISPOSAL CONSIDERATIONS

13.1 Incineration

Never incinerate Ni-Cd batteries.

13.2 Landfill

Never dispose Ni-Cd batteries as landfill.

13.3 Recycling

Nickel Cadmium batteries can be fully recyclable. They are submitted to the European community directive 91-157/CE . Saft recommends proper recycling of these batteries whenever possible.

You may refer to the following web page for further information and guidance :
www.ocde.org/ehs/nicd/nicdloc.htm (1). You can also contact Saft.

(1) This page provides links to different National Battery Associations and National Collection & Recycling Organisations that can provide you with the latest update on collection & recycling in their respective Countries.

14. TRANSPORT INFORMATION

Sealed Ni-Cd batteries with sleeve are not submitted to specific transport obligations. Sealed Ni-Cd batteries without sleeve are submitted to ADR prescription under UNO code 2800.

15. REGULATORY INFORMATIONS

Nickel Cadmium batteries are submitted to the European community directive 91-157/CE for recycling

16. OTHER INFORMATIONS

Consult SAFT specifications and precautions of use for optimized use.